

# P1.27 Improving Aviation Forecasts at the National Weather Service in Springfield, MO



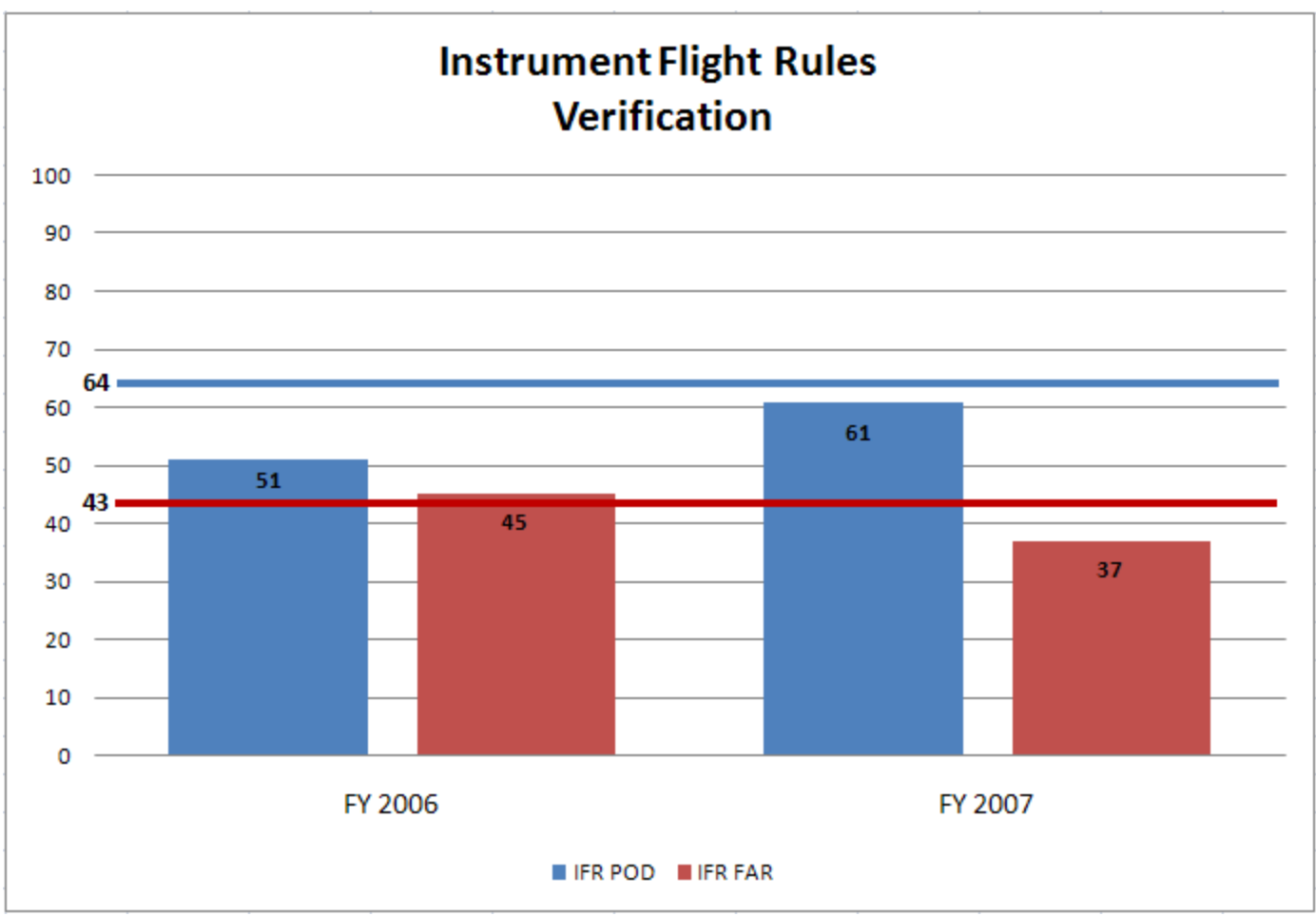
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Springfield, MO



## The Problem

- Missing GPRA Goals for POD/FAR
- Forecasters hesitant to forecast Instrument Flight Rules (IFR) conditions
  - Inexperience?
  - Tools?
  - Techniques?
  - Other Issues?



## The Plan

- Three tiered approach
  - Verification
  - Research
  - Awards

## Verification

- Individual/Office stats
- Near real-time event stats/review

## Research

- IFR Climatology
- Synoptic Climatology of IFR Events
- Rules of Thumb - proof

## Awards

- Recognition of good work/improvement
- Awardees required to write up their forecast methodology

## Near-Term Verification

- Feedback produced from Aviation SOD two days after an IFR event
  - As close to instantaneous feedback as possible
  - Allows forecasters to make weekly course corrections
  - What tools worked well/what tools didn't
  - Identify MOS trends/biases as well as local affects

## Near-Term Verification Example

All, Another great performance was turned in for the Sunday/Monday event. Please see attached. MAV MOS was way too slow bringing in the IFR (roughly 9 hours too slow from what I remember). Didn't have anything for JLN. A tool to possibly use is the SREF. To access: 1. Volume Browser: Plan View, 2. Field: Ensemble, 3. SREF Probabilities. You can look at probabilities for Cigs LT 3000, 1000 and 500 feet as well as Vsbys LT 3 miles and 1 mile. SREF was about 6 hours faster over MAV MOS in bringing in IFR conditions to SGF and even hit JLN.

	SGF POD	MOS POD	SGF FAR	MOS FAR
25-26 Nov 2007	77	66	22	26

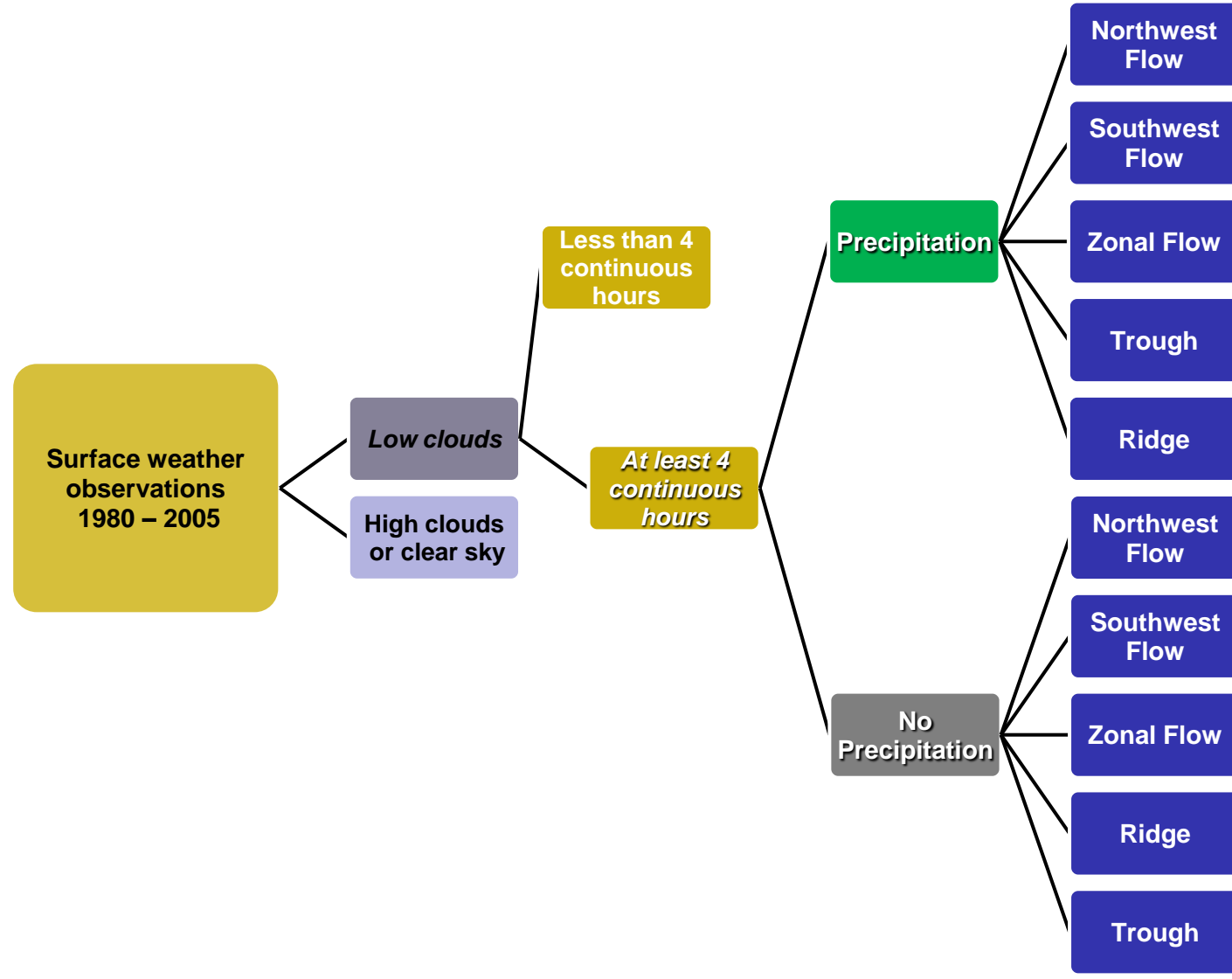
## Near-Term Verification Example

For the month (1 Nov-26 Nov), we have increased our IFR POD/FAR to 71%/26% vs. MAV POD/FAR 50%/31% respectively. Outstanding!

Conditional climo did hint at IFR conditions as well and I'd recommend looking at it when you're getting within the 6-12 hour time frame for an event. We have yet another system for the weekend (Friday night through Sunday afternoon) that we can make some more headway on. Have those southeast winds again from about 03Z Saturday through 12Z Saturday morning. Watch those. As soon as our winds shifted Sunday from the southeast to north, we tanked. Something to think about. Anyway, good job all and good luck this weekend. Thanks all, Gerry

## Research

- Synoptic Climatology of IFR Ceilings
- IFR cases identified by ASOS/SAO obs (SGF) from 1980 to 2005
- Cases stratified by synoptic regimes by season
- Composite Analysis Performed on each regime
  - NARR utilized and viewed via GEMPAK
  - SLU Compositing System
- Group Effort
  - 2 Hollings Scholars (2007 and 2008)
  - Student Independent Study (2009)
  - 3 NWS Personnel

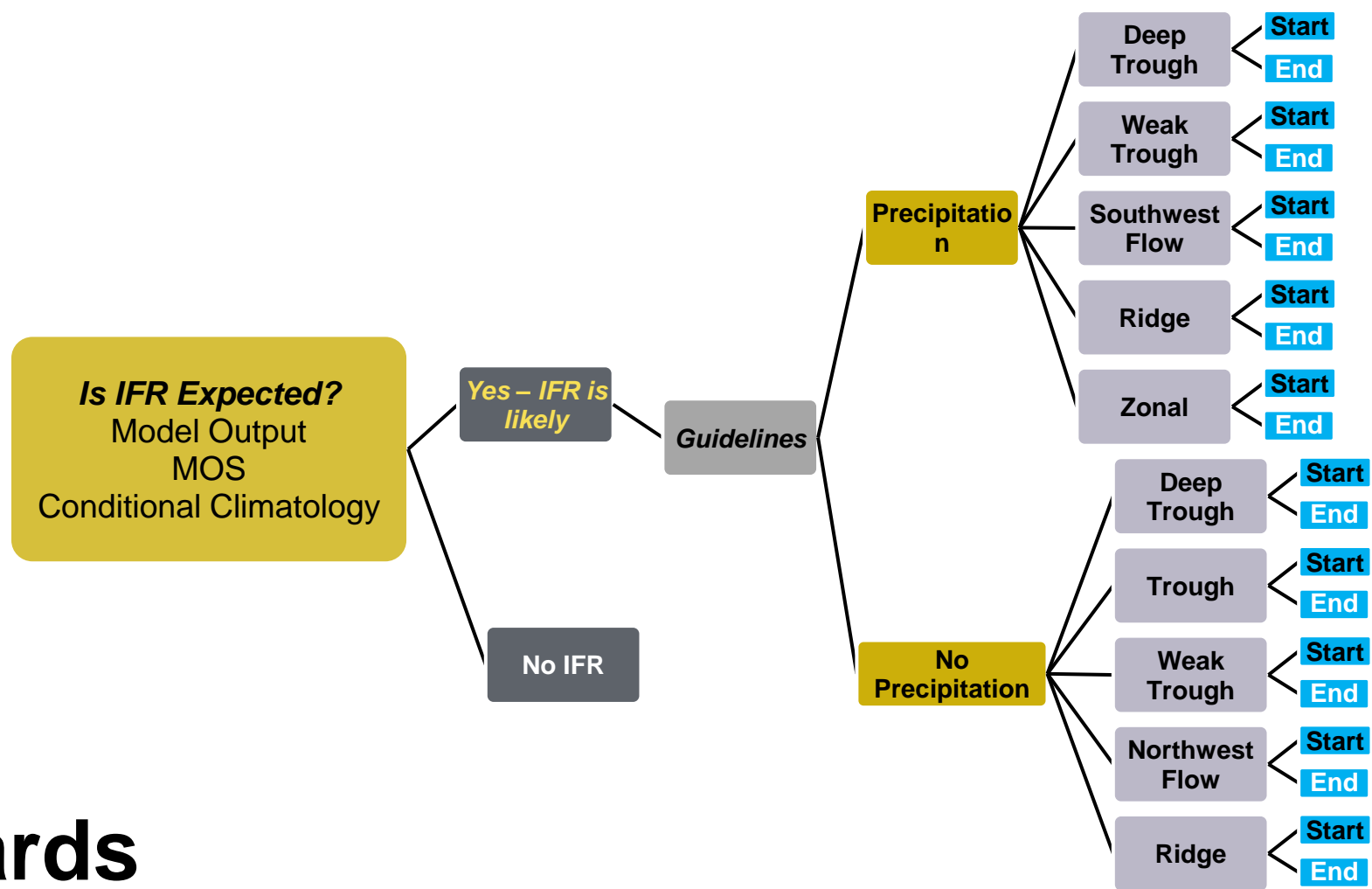


Precip		
Event	Start	End
Deep Trough	925mb Height Trough	850mb Isotherm Trough
Weak Trough	1000mb Inverted Height Trough	700mb Height Trough
Southwest Flow	Surface Cold Front	925mb Height Trough
Ridge	500mb Height Ridge	1000mb Closed Low Overhead
Zonal	925mb Inverted Height Trough	850mb Height Trough

No Precip		
Event	Start	End
Deep Trough	850mb Isotherm Trough	700mb Isotherm Trough
Trough	850mb Isotherm Trough	700mb Isotherm Trough
Weak Trough	700mb Height Trough	850mb Isotherm trough
Northwest Flow	925mb Height Ridge	850mb Height Ridge
Ridge	700mb Height Ridge	500mb Height Ridge

## Synoptic Climatology Benefits

- A match of patterns to guidelines increases situational awareness of an IFR event
- Higher quality and accuracy of forecasts
- Increases customer confidence in forecasts



## Awards

- Office maintains a quarterly award program for the best Aviation Forecaster Of The Quarter
- To maintain team concept, award only given if office reaches annual GPRA goal
- Awardees required to write up what worked (and didn't work) for the past quarter

## Award Breakdown

1. 0-6HR IFR (Everything under 1000ft/3 miles)
  - a) POD
  - b) % OVER CURRENT GPRA GOAL
  - c) % OVER GFS LAMP GUIDANCE
2. 0-6HR FAR
  - a) IFR FAR
  - b) % BELOW CURRENT GPRA
  - c) % UNDER GFS LAMP GUIDANCE

NOTE: 1 & 2 above will count for 40% of the total score

3. 0-6HR MVFR
  - a) POD
  - b) % OVER GFS LAMP GUIDANCE
  - c) MVFR FAR
  - d) % UNDER GFS LAMP GUIDANCE

NOTE: This score accounts for 15% in the scoring

4. 0-6HR IFR AMENDED TAFS
  - a) POD
  - b) % OVER CURRENT GPRA GOAL
  - c) % OVER GFS LAMP GUIDANCE
  - d) IFR FAR
  - e) % UNDER CURRENT GPRA FAR GOAL
  - f) % UNDER GFS LAMP GUIDANCE

NOTE: This score accounts for 15% in the scoring

## Award Breakdown (con't)

5. 6-12HR IFR
  - a) POD
  - b) % OVER CURRENT GPRA GOAL
  - c) % OVER GFS LAMP GUIDANCE
  - d) IFR FAR
  - e) % UNDER CURRENT GPRA FAR GOAL

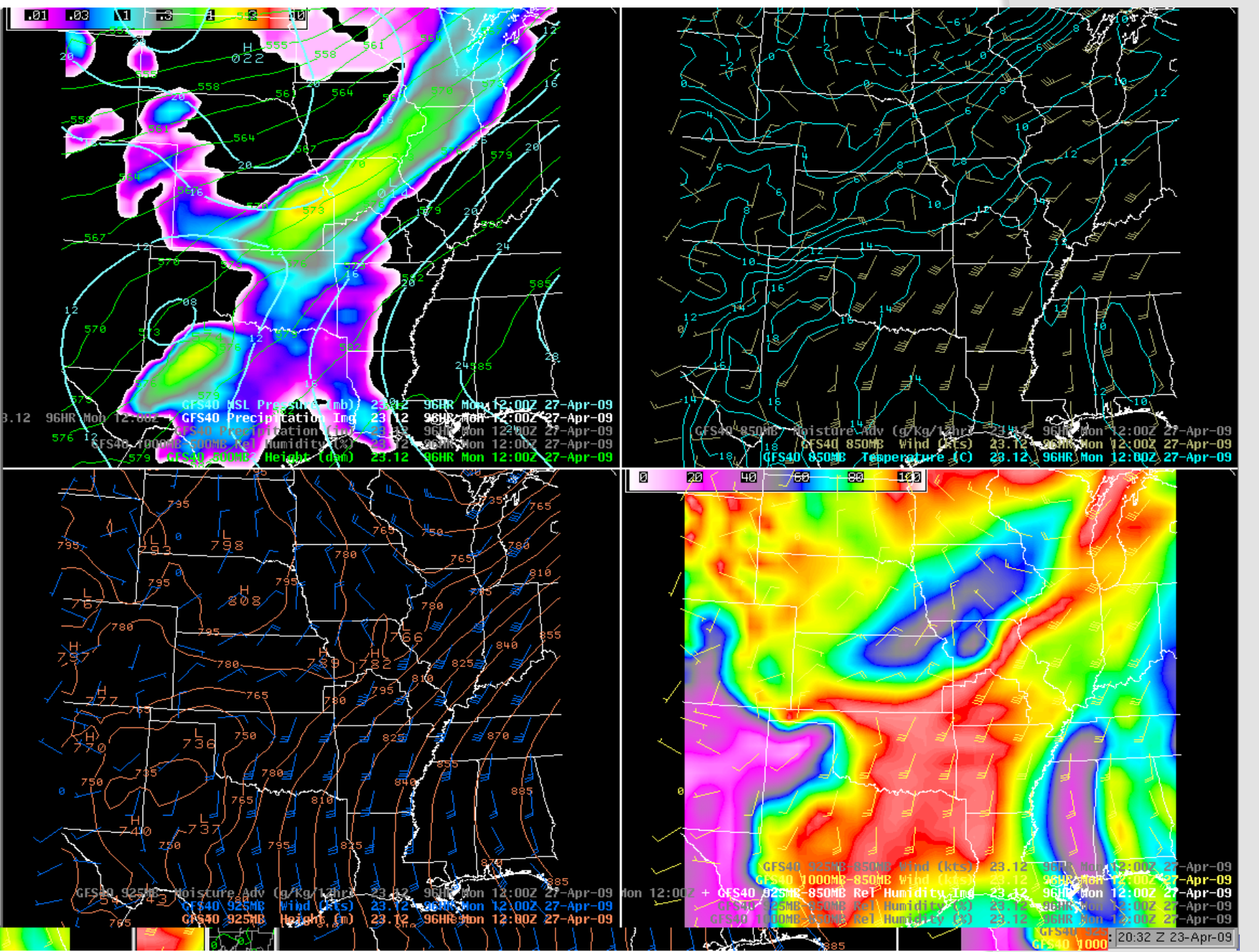
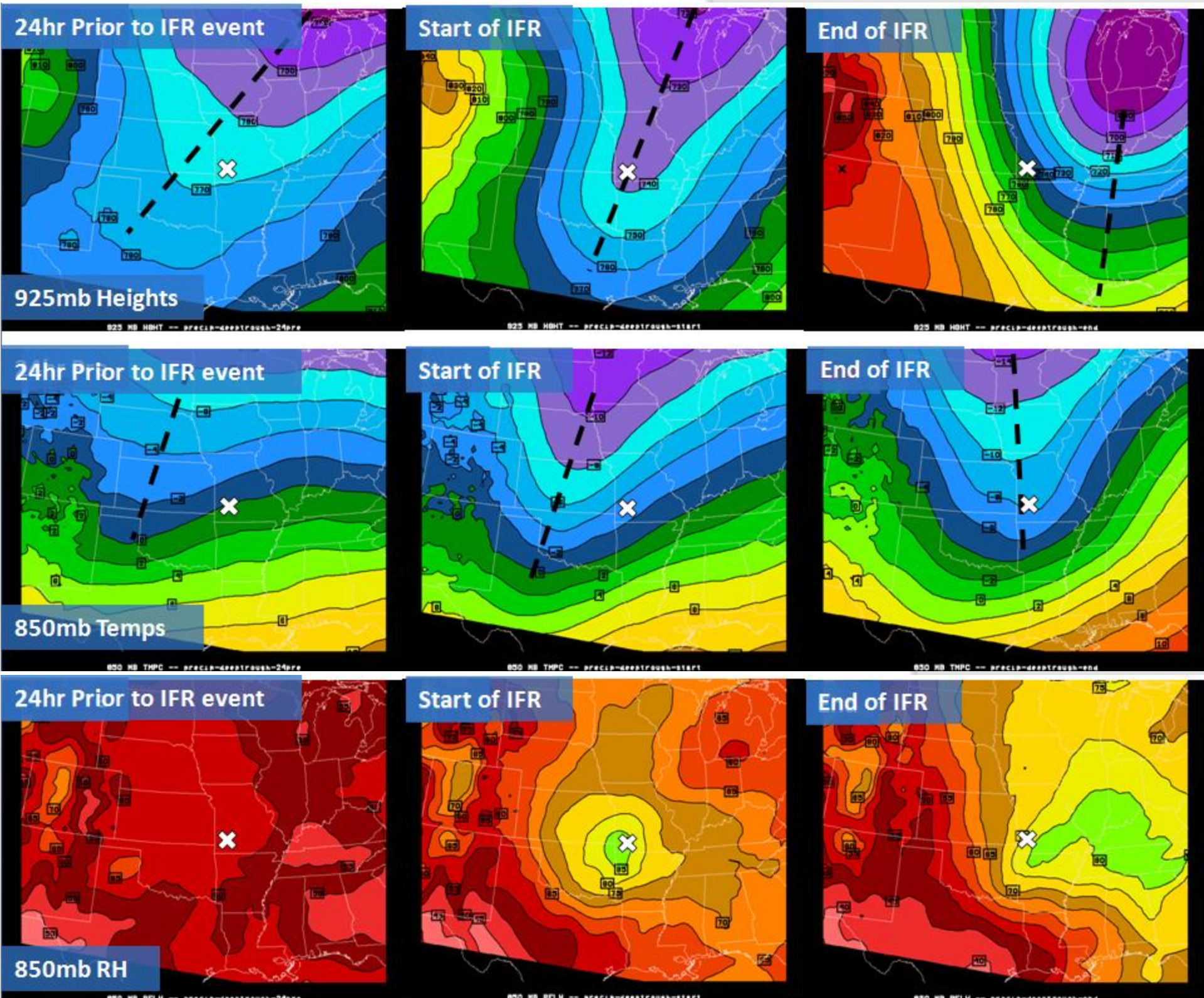
NOTE: The score from 5 accounts for 15% in the scoring

6. 0-6HR WIND DIRECTION and SPEED
  - a) DIR % CORRECT
  - b) % OVER LAMP MOS
  - c) SPEED % CORRECT
  - d) % OVER LAMP MOS

NOTE: The score from 6 accounts for 10% in the scoring

7. 0-6HR THUNDERSTORM, RAIN, FOG, SNOW, FREEZING RAIN - CSI for each.
8. TEMPO
  - a) % GOOD TEMPO
  - b) % BAD TEMPO (Highest BAD TEMPO, the highest assigned number)

NOTE: The scores from 7 and 8 above account for 5% total in the scoring



## Near-Term Verification Example

"...This last quarter I worked a couple fog events, with the fog developed over the TAF sites during my TAF forecast period. In events such as this, upstream observation data is not as useful since the conditions are developing overhead. What helped me in my decision making in my ceiling and visibilities forecast, was going outside and looking at current conditions. During the fog events I worked there was already a nice dew on the cars by midnight, and in one case the R shift forecaster called in on the way home and let me know that a little ground fog was already developing in low lying areas...To help me determine how low to take visibilities, I like looking at the cross over temps and the forecast low to determine the potential for fog overnight. The Fog Plot program in AWIPS is a good way to view these for our 5 ASOS/AWOS sites. This program takes the afternoon crossover temp and compares it with the forecast low and will give a guess of how low visibilities could go based on these. This program does take the NAM winds into account in its guess, but I would verify the winds. If the forecast low is off or there is low level moisture (dry or moist) advection, its guess could be off..."

## End Result

